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To predict success in reading achievement, 148 first graders from three schools representing a cross section of the economic structure of a southeastern U.S. community were administered, in September, the following tests: the Frostig Developmental Test of Visual Perception, the Gates Reading Readiness Test, the Metropolitan Readiness Test, and the Olson Reading Readiness Test. The Wechsler Intelligence Scale for Children was administered in December and the Stanford Achievement Test, Primary I Battery, in May. In May of the subjects' third-grade year the Stanford Word Reading and the Stanford Paragraph Meaning subtests were given. For first grade the best predictor of both word meaning and paragraph meaning was the Olson Reading Readiness Test. A combination of the Metropolitan Readiness Test and the Wechsler Intelligence Scale for Children was the best predictor for third-grade reading achievement. It was concluded that intellectual functioning instead of specific skill ability would be the most important information that the classroom teacher would need to know in order to predict later reading achievement. References are included. (CM)

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PREDICTIVE VALIDITY OF SELECTIVE READING READINESS FACTORS *

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The prediction of behavior has long been one of the goals of scientific investigation in psychology and education. A major concern of teachers and reading specialists has been the prediction of success in beginning reading. Measures that would give an accurate prediction of achievement in reading would enable teachers to identify the children who could succeed and those who were destined to fail without having special help. With the former group, the teacher could proceed with

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* This study is a follow-up of the study, A multivariate analysis of first grade reading achievement, reading readiness and intelligence, which was conducted by Olson, A.V., Simpson, Rosen, Olson, N.H., and Rentz (1968).

formal reading instruction while the latter group continued in a readiness program until success in reading was assured.

Many of the readiness tests now used by the teacher are not considered sufficiently broad or diagnostic. In fact, many of the important elements of readiness are not evaluated by these measures. An inspection by Spache (9), of some of the more widely used tests revealed a number of inadequacies. Spache divided readiness tests into two categories--those that measure actual pre-reading skills and those that evaluate some of the significant elements of readiness such as physical, social, emotional, or intellectual. He stated that the Gates Reading Readiness Test, the Metropolitan Readiness Test, the Harrison-Stroud Test, and the Lee-Clark Reading Readiness Test are primarily tests of educational readiness or pre-reading skills. These include tests of word matching, rhyming, reading and copying letters and numbers, word and picture concepts, and the like. Such tests sample only the preschool learning of the child, or the environmental and, possibly, the intellectual factors. A crude assessment of visual perception is also present in some of these tests in the form of word matching. Auditory discrimination is tested by rhyming or alliteration subtests.

The Murphy-Durrell Diagnostic Reading Readiness Test stresses visual and auditory discrimination to the exclusion of measures of preschool learning. It includes also a third subtest of learning rate which probably samples the intellectual factor. Spache feels that with our knowledge of how to test perceptual skills, it is doubtful that the particular measures of perception and discrimination used in these tests are sufficient or significant.

The most commonly used predictive measures of success in learning to read have been readiness and intelligence tests. There is disagreement, however, among authorities concerning the value of administering readiness tests and intelligence tests at the first grade level. Many educators have voiced the belief that the same abilities are being measured with each type of test.

Smith and Dechant (8), state:

> Mental age scores have been found to be closely related both to reading readiness and to reading achievement. Generally, mental age scores correlate highly with reading readiness test scores. In numerous studies and summaries of research, the correlation between these two sets of scores has been found to range from about .35 to .80. We know that reading achievement test scores also correlate highly with intelligence test scores. This leads us to conclude that to a large extent reading achievement and reading readiness tests measure the same factors that are measured by intelligence tests (p. 89).

Witty and Kopel (11), reported a correlation of .60 between readiness and intelligence test scores which they asserted was too low to predict one from the other. They pointed to the similarity in types of questions used in group tests of intelligence and reading tests, as an explanation for part of this relationship.

Bliesmer (1), found that correlations between reading readiness scores and measures of early reading success normally fell between .50 and .60.

Readiness tests do an adequate job of identifying the extremes on the normal curve, those who will probably succeed and those who will probably fail. However, the large group of children in the middle may go in either direction when placed in a reading program. A survey of

the literature indicates an urgent need for the development of better measures or batteries of measures than we now have for predicting reading achievement.

The purpose of the present study was to determine the extent to which certain reading readiness tests for predicting achievement in first grade are effective as predictors of success in grade three.

METHOD

Subjects. The subjects selected (N=148) for inclusion in the study were drawn from three elementary schools in a city of approximately fifty thousand people in the southeastern part of the United States. Each of the three schools was selected to get a cross section of the economic structure of the community. The total population consisted of 218 first grade children. The mean chronological age for this population was 6 years and 3 months with a standard deviation of 7 months. The mean verbal IQ and Performance IQ of the subjects as measured by the WISC was 92.44, SD 17.18 and 97.44, SD 16.92 respectively. The subjects for the third grade part of the study (N=148) do not represent all of the subjects in the first grade due to expected population attrition over a two year period. The means and standard deviations for the total population and the population represented in this study did not differ significantly.

During September of the first grade all of the subjects were administered the following tests: (1) Frostig, Developmental Test of Visual Perception, 1963; (2) Gates, Gates Reading Readiness Test, 1939; (3) Hildreth, Griffiths, and McGauvran, Metropolitan Readiness Test, 1950; and Olson, Olson Reading Readiness Test. The WISC was administered through December and the Stanford Achievement Test - Primary I Battery

was administered in May. The Stanford Word Reading and Stanford Paragraph Meaning were given in May at the end of the subjects third year in school.

In order to determine the predictive validity of selective reading readiness factors for first and third grade reading achievment, a stepwise regression analyses was employed. The four sets of readiness variables used as predictors of Stanford Word Reading and Stanford Paragraph Meaning were:

1. The Frostig Developmental Test of Visual Perception (FDTVP) (5 subtests).
2. The Olson Reading Readiness Test (ORRT) (6 subtests).
3. The Gates Reading Readiness Test (GRRT) (4 subtests).
4. The Metropolitan Readiness Test and the Wechsler Intelligence Scale for Children (MRT and WISC) (3 subtests) (Since the MRT seemed to be a unifactor test in the Olson et al. study, the total score was the only MRT variable considered. It was included with the WISC in order that maximum prediction of the criterion could be obtained.)

Table I presents the findings of the multiple correlations for each of the four sets of the readiness variables as predictors of Stanford Word Reading and Stanford Paragraph Meaning at the first and third grade levels.

Table I

Summary of the Multiple Correlation Results for First and Third Grades

Variable set	Total Number of subtests	First Grade Achievement Multiple R	Third Grade Achievement Multiple R
Stanford Word Reading			
FDTVP	5	.57	.55
ORRT	6	.67	.65
GRRT	4	.62	.56
MRT and WISC	3	.63	.70
Stanford Paragraph Meaning			
FDTVP	5	.55	.58
ORRT	6	.71	.65
GRRT	4	.61	.59
MRT and WISC	3	.60	.68

In the analysis of the first grade data, the best predictor for Stanford Word Reading was the ORRT. This subtest had a multiple correlation of .67. However, the best predictor for Stanford Word Reading at the third grade level was a combination of the MRT and the verbal and performance subtests of the WISC. This subtest had a multiple correlation of .70. The second best predictor for Stanford Word Reading at third grade level was the ORRT with a multiple correlation of .65.

The best predictor for Stanford Paragraph Meaning at first grade level was the ORRT. The multiple correlation coefficient for this subtest was .71. The best predictor for Stanford Paragraph Meaning at third grade was a combination of the MRT and the WISC. The multiple correlation for this subtest was .68. The ORRT was the second best predictor for Stanford Word Reading at third grade level. The multiple correlation for the ORRT was .65.

FINDINGS AND DISCUSSION

For first grade the best predictor was the Olson Reading Readiness Tests. A combination of the Metropolitan Readiness Test and the Wechsler Intelligence Scale for Children was the best predictor for third grade reading achievement. However, the difference between these three tests was the difference between a multiple correlation of .67 and .70 which is very small indeed. It should be noted that these data predicted third grade achievement better than first grade achievement.

The results of these findings would imply that for the purposes of predicting reading achievement, the classroom teacher could get valuable information about the degree of success to be expected from a test comparable to the Olson Reading Readiness Tests or a general reading readiness test in combination with an intelligence test. The administration

of more than one type of readiness test would not appear to yield very much additional information helpful in determining a child's reading potential. If the teacher chose to administer a combination of a general readiness test and intelligence test to predict reading achievement, it does not appear that it would add to the prediction of reading aibility any more than the readiness test would by itself. In addition, an examination of the variable loadings on the Verbal Comprehension factor contained in the Olson et al. study (1), indicated that the verbal tests on the Wechsler Intelligence Scale for Children seem to be the factor most closely related to achievement. The factor next most closely related to first grade reading achievement is Verbal Association. The data imply that intellectual functioning instead of specific skill ability would be the most important information that the classroom teacher would need to know in order to predict later reading achievement. Thus, the level of verbal functioning will probably determine the extent to which school acquired verbal comprehension skills will be learned.

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